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DATE: April 23, 2012

TO: Kelley Chase, EPA Region 3 OSC
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THROUGH: Ex. 4 - CBI SERAS Program Manager
Ex. 4 - CBI SERAS QA/QC Officer

FROM: Ex. 4 - CBI QA/QC Chemist

SUBJECT: VERIFICATION/COMPLETENESS CHECK – DIMOCK, PA LABORATORY DATA
File NAREL 1100244-GAMMA.pdf
File NAREL 1100244-Th.pdf
File NAREL 1100244-U.pdf
File NAREL 1100244-Ra228.pdf

INTRODUCTION

On April 12 to 16, 2012, a review of the case narratives and corresponding certificates of analysis from the U.S. EPA National Air and Radiation Environmental Laboratory (NAREL Reports Posted April 5) was conducted at the SERAS facility in accordance with the Follow-Up Verification/Completeness Check agreed upon during our teleconference on Wednesday 2/8/12.

The assumptions for this review include the following: 1) Case narratives from the EPA and Regional labs and/or subcontract labs have been reviewed in accordance with EPA, Regional or Environmental Services Assessment Team (ESAT) protocols and contain all pertinent and complete information to conduct the completeness check. SERAS will base this review on the information provided by the laboratory and not on an actual data package; and 2) SERAS will relay any "red" flags to the EPA R3 personnel to resolve and determine data usability.

OBSERVATIONS

In accordance with Table 1 – Field and QC Sampling Summary (Rev01 - 2/3/12), Table 2 – Sample Analytical Requirements Summary (Rev01 – 2/3/12), Methods for Groundwater and Surface Water, NAREL AM/SOP-3 Standard Operating Procedure for Gamma-Ray Spectrometry, NAREL AM/SOP-1 Actinides in Environmental Matrices by Extraction Chromatography and NAREL AM/SOP-13 Standard Operating Procedure for Measuring Radium-228 in Environmental Matrices and the validation guidelines developed by SERAS for radiochemical data (using critical value of 1.65), the following observations were noted and need to be clarified/resolved.

General Comments: Gamma, U and Th Analysis:

1. Raw data were not provided; therefore, it is assumed that all sample, method blank and QC results (LCS, Duplicates) were correctly transferred to the analytical result tables.
2. No equipment blanks were analyzed with this sampling batch. No qualifications could be made based on equipment blank contamination.

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1. No minimum detectable concentrations (MDCs) were listed for the following: FB04 (affecting sample HW06), HW18, HW18-P, HW13, HW25-P, HW29z, HW35A, HW29, HW33, HW33A-P and FB07 (affecting samples HW26, HW26-P and HW52). Since the MDC values are typically needed to conduct a thorough data assessment, data, if qualified, were based on the 2σ uncertainty only.
2. The Z score of Bi214 for the duplicate analysis of sample HW13 was above QC limits. Bi214 should be qualified "J" in the result qualifier column in Scribe for sample HW13.
3. The absolute value of the sample result was greater than the 2σ uncertainty. The following results should be qualified unusable "R" in the result qualifier column in Scribe: U235 for samples HW18, HW18-P, HW13, HW25-P, HW33, HW33A-P, HW29z, HW35A, FB07 and HW29: Pb212 for samples HW18, HW25-P HW33, HW33A-P, HW29z and HW29; and Th234 for sample FB07.
4. The absolute value of the sample was less than the 2σ uncertainty. The following results should be qualified as "U": Bi212 for samples HW06, HW26, HW26-P and HW52.
5. The absolute value of the sample was less than the 2σ uncertainty and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified as "UJ" in the result qualifier column in Scribe: Ra228 for sample HW32-P; Th234 for samples HW06, HW26-P, HW20, HW20-P, HW32, HW32-P, HW52 and HW33B-P; U235 for samples HW20, HW20-P, FB06, HW32-P and HW52; Ra226 for samples HW26-P, HW20-P, HW32, HW32-P and HW52; and K40 for samples HW20, HW20-P, FB06, HW32 and HW32-P.
6. The sample result was greater than the 2σ uncertainty but less than the MDC and the uncertainty multiplied by 1.65 is less than or equal to the MDC indicating that the MDC may be reported too low. Tl208 for sample HW26 should be qualified "J".
7. The sample result was less than the 2σ uncertainty and the MDC. The following results should be qualified "U" in the result qualifier column in Scribe: Ra226 for samples HW26, HW20, FB06 and HW33B-P; Ra228 for samples HW26, HW32 and HW33B-P; U235 for samples HW26-P, HW32 and HW33B-P; Bi212 for samples FB06 and HW33B-P; and Tl208 for sample FB06.
8. The sample result was less than the 2σ uncertainty and the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified "UJ" in the result qualifier column in Scribe: K40 for samples HW06, HW26, HW26-P, HW52 and HW33B-P; Ra226 for sample HW06; Ra228 for samples HW06, HW26-P, HW20, HW20-P, FB06 and HW52; U235 for samples HW06 and HW26; Th234 for samples HW26 and FB06; Tl208 for sample HW26-P; Bi212 for samples HW20, HW20-P, HW32 and HW32-P; and Pb212 for sample: FB06.

9. The following sample results failed the NAD criteria. Bi214 for sample HW06 and Pb214 for sample: HW06 should be qualified "J" in the result qualifier column in Scribe.

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1. The sample result is greater than the 2σ uncertainty but less than the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified "UJ" in the result qualifier column in Scribe: Th228 for samples FB07 and HW52.
2. The absolute value of the sample was less than the 2σ uncertainty. The following results should be qualified non-detect "U" in the result qualifier column in Scribe: Th227 for samples HW26 and HW20 and Th232 for samples HW18, HW20-P, FB06, HW29z and HW52.
3. The sample result was less than the 2σ uncertainty and the MDC. The following results should be qualified non-detect "U" in the result qualifier column in Scribe: Th230 for samples HW26, HW18, HW20, HW33, HW33A-P, HW29z, FB07, HW29 and HW33B-P; Th228 for samples HW18-P, HW13 and HW32-P; Th227 for samples FB06, HW13, HW32-P, HW29z and FB07; and Th232 for samples HW33, HW32-P and HW33B-P.
4. The sample result was less than the 2σ uncertainty and the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified "UJ" in the result qualifier column in Scribe: Th232 for samples HW06, HW26-P, HW18-P, HW13, HW25P, HW33A-P, HW32, HW35A and HW29; Th228 for samples HW26, HW26-P, HW18, HW-20, HW20-P, FB06, HW25P, HW33, HW33A-P, HW29z, HW29 and HW33B-P; Th227 for samples HW26-P, HW20-P, HW25P, HW33, HW33A-P and HW33B-P; and Th230 for samples HW26-P, HW18-P, HW20-P, FB06, HW13, HW25P, HW32, HW32-P, HW35A and HW52.
5. The following sample results failed the NAD criteria. Th227 for samples HW06, HW18, HW18-P, HW32, HW35A, HW29 and HW52; Th228 for samples HW06, HW32 and HW35a; Th230 for sample HW06; and Th232 for sample HW26 should be qualified "J" in the result qualifier column in Scribe..

File NAREL 1100244-U.pdf

1. No field blank data was submitted for the sample taken on 1/26/12 (HW06). This sample could not be evaluated against a field blank.
2. The sample result is greater than the 2σ uncertainty but less than the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified "UJ" in the result qualifier column in Scribe: U234 for sample HW26-P and U238 for sample HW32-P.
3. The absolute value of the sample was less than the 2σ uncertainty. The following results should be qualified non-detect "U" in the result qualifier column in Scribe: U235 for sample HW33A-P.
4. The sample result was less than the 2σ uncertainty and the MDC. The following results should be qualified non-detect "U" in the result qualifier column in Scribe: U235 for samples HW06, HW26, HW18-P, HW20-P, HW32-P and HW35a; and U234 for sample HW35A.
5. The sample result was less than the 2σ uncertainty and the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified "UJ" in the result qualifier column in Scribe: U234 for samples HW26, FB06 and FB07; U238 for samples HW26, HW26-P, FB06, HW25-P and FB07; and U235 for samples HW26-P, HW18, HW20, FB06, HW25-P, HW33, HW29z, FB07, HW29, HW52 and HW33B-P.
6. The following sample results failed the NAD criteria. U234 for samples HW32 and HW32-P should be qualified "J" in the result qualifier column in Scribe.

File NAREL 1100244-Ra228.pdf

1. For Radium-228 analysis, the sample result was less than the MDC and the 2σ uncertainty and the uncertainty multiplied by 1.65 is less than the MDC. Samples HW18, HW20, FB06, HW35a, FB07, HW29 and HW33b-P should be qualified non-detect "U" in the result qualifier column in Scribe.
2. For Radium-228 analysis, the absolute value of the result was less than the 2σ uncertainty and the uncertainty multiplied by 1.65 was less than the MDC. Sample HW33a-P should be qualified non-detect "U" in the result qualifier column in Scribe.
3. For Radium-228 analysis, the sample result was less than the MDC and the 2σ uncertainty and the uncertainty multiplied by 1.65 is greater than the MDC. Samples HW06, HW20-P, HW13, HW33 and HW52 should be qualified "UJ" in the result qualifier column in Scribe.
4. For Radium-228 analysis, the sample result was less than the MDC and greater than the 2σ uncertainty and the uncertainty multiplied by 1.65 is greater than the MDC. Samples HW26, HW26-P, HW18-P, HW25-P, HW32, HW32-P and HW29z should be qualified "UJ" in the result qualifier column in Scribe.
5. It is assumed that all required instrument/system criteria were met by the laboratory or had no impact on the data.

cc: Ex. 4 - CBI, SERAS Project Officer
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